

Application No. 10/044,368
Reply to Final Office Action dated October 1, 2004

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-4. (Cancelled)

5. (Withdrawn) A filter assembly for capturing debris within a blood vessel, comprising:

an elongate shaft having a proximal end and a distal end;
a filter disposed proximate the distal end of the elongate shaft; and
a means for reducing the volume of the captured debris.

6. (Withdrawn) The filter assembly of claim 5, wherein the means for reducing the volume of the captured debris comprises a lumen defined by the elongate shaft; and
a fluid source fluidly communicating with the lumen for delivering a pharmaceutical agent to a location proximate the filter.

7. (Withdrawn) The filter assembly of claim 5, wherein the elongate shaft comprises an electrically conductive core and an electrically insulating layer overlaying the electrically conductive core; and

the means for reducing the volume of the captured debris comprises a radio frequency energy source electrically coupled to the electrically conductive core of the elongate shaft and at least one aperture extending through the electrically insulating layer of the elongate shaft.

8. (Withdrawn) The filter assembly of claim 5, wherein the filter has a first portion having a first included angle and a second portion having a second included angle;
the first included angle being greater than the second included angle; and
the second portion of the filter being configured such that fine debris will be extruded through the second portion of the filter when the filter is collapsed.

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9. (Withdrawn) A filter assembly for capturing debris within a blood vessel, comprising:

an elongate shaft having a proximal end and a distal end;

a filter disposed proximate the distal end of the elongate shaft; and

a lumen defined by the elongate shaft for delivering a pharmaceutical agent to an area proximate the filter.

10. (Withdrawn) The filter assembly of claim 9, further including at least one aperture defined by a wall of the elongate shaft and fluidly communicating with the lumen.

11. (Withdrawn) The filter assembly of claim 9, further including a fluid source coupled to the proximal end of the elongate shaft and fluidly communicating with the lumen.

12. (Withdrawn) The filter assembly of claim 9, wherein the filter includes an expandable frame.

13. (Withdrawn) The filter assembly of claim 9, wherein the filter includes a filter membrane.

14. (Withdrawn) The filter assembly of claim 9, wherein the frame comprises a shape memory material.

15. (Withdrawn) The filter assembly of claim 9, wherein the shape memory material comprises a shape memory alloy.

16. (Withdrawn) The filter assembly of claim 9, wherein the shape memory alloy comprises nitinol.

17. (Withdrawn) The filter assembly of claim 9, wherein the filter membrane portion of the filter tapers distally.

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18. (Withdrawn) The filter assembly of claim 9, wherein the membrane includes polyurethane.

19. (Withdrawn) The filter assembly of claim 9, wherein the membrane defines a plurality of apertures.

20. (Withdrawn) A filter assembly for capturing debris within a blood vessel, comprising:

an elongate shaft having a proximal end and a distal end;

a filter disposed proximate the distal end of the elongate shaft;

the elongate shaft comprising an electrically conductive core and an electrically insulating layer overlaying the electrically conductive core; and

at least one aperture extending through the electrically insulating layer of the elongate shaft.

21. (Withdrawn) The filter assembly of claim 20, wherein the at least one aperture is disposed proximate the filter.

22. (Withdrawn) The filter assembly of claim 20, further including a lead wire electrically coupled to the elongate shaft.

23. (Withdrawn) The filter assembly of claim 20, further including a radio frequency energy source electrically coupled to the conductive core of the elongate shaft.

24. (Withdrawn) The filter assembly of claim 20, wherein the filter includes an expandable frame.

25. (Withdrawn) The filter assembly of claim 20, wherein the filter includes a filter membrane.

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26. (Withdrawn) The filter assembly of claim 20, wherein the frame comprises a shape memory material.

27. (Withdrawn) The filter assembly of claim 20, wherein the shape memory material comprises a shape memory alloy.

28. (Withdrawn) The filter assembly of claim 20, wherein the shape memory alloy comprises nitinol.

29. (Withdrawn) The filter assembly of claim 20, wherein the filter membrane portion of the filter tapers distally.

30. (Withdrawn) The filter assembly of claim 20, wherein the membrane includes polyurethane.

31. (Withdrawn) The filter assembly of claim 20, wherein the membrane defines a plurality of apertures.

32. (Previously Presented) A filter assembly for capturing debris within a blood vessel, comprising:

an elongate shaft having a proximal end and a distal end;

a filter disposed proximate the distal end of the elongate shaft, the filter including a first tapered portion and a second tapered portion;

the first tapered portion defining a base diameter, an apex, and a first included angle; and

the second tapered portion extending proximally from the base diameter of the first tapered portion, the second tapered portion defining a first diameter at the base diameter, a second diameter greater than the first diameter, and a second included angle different from the first included angle.

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33. (Previously Presented) The filter assembly of claim 32, wherein the filter has an expanded shape and a contracted shape.

34. (Previously Presented) The filter assembly of claim 32, wherein the first tapered portion has a conical shape.

35. (Previously Presented) The filter assembly of claim 32, wherein the second tapered portion has a frustaconical shape.

36. (Previously Presented) The filter assembly of claim 32, wherein the filter includes a filter membrane.

37. (Previously Presented) The filter assembly of claim 36, wherein the filter membrane includes polyurethane.

38. (Previously Presented) The filter assembly of claim 36, wherein the filter membrane defines a plurality of apertures.

39. (Previously Presented) The assembly of claim 32, wherein the filter includes an expandable frame.

40. (Previously Presented) The filter assembly of claim 39, wherein the expandable frame comprises a shape memory material.

41. (Previously Presented) The filter assembly of claim 40, wherein the shape memory material comprises a shape memory alloy.

42. (Previously Presented) The filter assembly of claim 41, wherein the shape memory alloy comprises Nitinol.

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43. (Previously Presented) The assembly of claim 39, wherein the expandable frame includes a plurality of filter struts each having a proximal end and a distal end.

44. (Previously Presented) The assembly of claim 43, wherein said plurality of filter struts are adapted to bias the filter in an expanded position.

45. (Previously Presented) The assembly of claim 39, wherein the proximal end of each filter strut is connected to a filter mouth frame.

46. (Previously Presented) The assembly of claim 32, further including a retrieval sheath for retrieving the filter.

47. (Previously Presented) The filter assembly of claim 46, wherein the base diameter of the first tapered portion is smaller than an inner diameter of the retrieval sheath.

48. (Previously Presented) The assembly of claim 46, wherein the base diameter of the first tapered portion is similar to an inner diameter of the retrieval sheath.

49. (Previously Presented) The filter assembly of claim 46, wherein the first diameter of the second tapered portion is similar to the inner diameter of the retrieval sheath when the filter assumes an expanded shape.

50. (Previously Presented) The filter assembly of claim 46, further including a limiter that limits the base diameter of the first tapered portion to a diameter that is substantially similar to an inner diameter of the retrieval sheath.

51. (Previously Presented) The filter assembly of claim 50, wherein the limiter comprises a wire loop.